FACT SHEET

United States Environmental Protection Agency (EPA)
Region 10
Park Place Building, 13th Floor
1200 Sixth Avenue, OW-130
Seattle, Washington 98101
(206) 553-1214

Date: June 17, 1998

Permit No.: ID-002206-3

PROPOSED REISSUANCE OF A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT TO DISCHARGE POLLUTANTS AND TO LAND APPLY/TRANSFER SEWAGE SLUDGE (BIOSOLIDS) PURSUANT TO THE PROVISIONS OF THE CLEAN WATER ACT (CWA)

CITY OF NAMPA

has applied for reissuance of a NPDES permit to discharge pollutants pursuant to the provisions of the CWA. This Fact Sheet includes (a) the tentative determination of the EPA to reissue the permit, (b) information on public comment, public hearing and appeal procedures, (c) the description of the current discharge and biosolids practices, (d) a listing of tentative effluent limitations, schedules of compliance and other conditions, and (e) a sketch or description of the discharge and biosolids land application locations. We call your special attention to the technical material presented in the latter part of this document.

Persons wishing to comment on the tentative determinations contained in the proposed permit reissuance may do so by the expiration date of the Public Notice. All written comments should be submitted to EPA as described in the Public Comments Section of the attached Public Notice.

After the expiration date of the Public Notice, the Director, Office of Water, will make final determinations with respect to the permit reissuance. The tentative determinations contained in the draft permit will become final conditions if no substantive comments are received during the public notice period.

The permit will become effective 30 days after the final determinations are made, unless a request for an evidentiary hearing is submitted within 30 days after receipt of the final determinations.

The proposed NPDES permit and other related documents are on file and may be inspected at the above address any time between 8:30 a.m. and 4:00 p.m., Monday through Friday. Copies and other information may be requested by writing to EPA at the above address to the attention of the NPDES Permits Unit, or by calling (206) 553-1214. This material is also available from the EPA Idaho Operations Office, 1435 N. Orchard Street, Boise, Idaho 83706.

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TECHNICAL INFORMATION

I. Applicant

City of Nampa
411 3rd St. South
Nampa, Idaho 83651

NPDES Permit No.: ID-002206-3
Facility contact: Larry Bledsoe, Public Works Director

II. Activity

The City of Nampa owns and operates a wastewater treatment plant that treats domestic wastewater as well as industrial wastewater. The facility provides secondary treatment of wastewater prior to discharging it to Indian Creek. The facility is designed for an average annual flow of 11.76 million gallons per day (MGD). Currently, the average annual monthly flow is approximately 6.6 MGD.

A fact sheet and draft NPDES permit were public noticed for this facility on September 30, 1994. However, a final permit was never issued. Since 1994, the water quality standards for Indian Creek have been revised to include the protection of cold water biota. Therefore, a new fact sheet and draft NPDES permit have been developed which include the cold water biota designation for Indian Creek.

III. Receiving Water

A. Outfall location: The City of Nampa wastewater treatment plant discharges its wastewater to Indian Creek via outfall 001. Outfall 001 is located at latitude 43° 35' 50" and longitude 116° 34' 52".

B. Water Quality Standards: A state's water quality standards are composed of use classifications, and numeric and/or narrative water quality criteria.

The first part of a State's water quality standard is a classification system for water bodies based on the expected beneficial uses of those water bodies. The Idaho *Water Quality Standards and Wastewater Treatment Requirements* (IDAPA 16.01.02.140.01.z.) protect Indian Creek below Sugar Avenue for the following use classifications: cold water biota, secondary contact recreation and agricultural water supply.

The second part of a state's water quality standards is the water quality criteria deemed necessary to support the beneficial use classification of each water body. These criteria may be numeric or narrative.

The criteria that are necessary to protect cold water biota are found in:

- 40 CFR §131.36 (b)(1), columns B1, B2, and D2 (with the exception of

the human health arsenic criteria),

- The human health criteria for arsenic are found in Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.250.02.a.iv.
- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200.,16.01.02.250.02.a., and 16.01.02.250.02.c.

The criteria necessary to protect secondary contact recreation are found in:

- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200., 16.01.02.250.01.b;
- 40 CFR §131.36(b)(1), column D2 (with the exception of the human health criteria for arsenic);
- The human health criteria for arsenic is found in Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.250.01.c.

The criteria necessary to protect for agricultural use is found in:

- Idaho's *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02.200., and 16.01.02.250.03.b.

A summary of the water quality criteria applicable to Indian Creek are listed in Appendix A.

C. Indian Creek Flows: Flows were calculated using data from the U.S.G.S. gaging station located upstream of the Nampa wastewater treatment facility (station #13211309. The period of record was from 1982 to 1995 and contained 3816 values. The following are low flows applicable to Indian Creek:

1Q10 = 15.7 cfs
7Q10 = 16.1 cfs
30Q5 = 17.7 cfs
Harmonic Mean Flow = 36.8 cfs

For additional discussion of flows see Appendix B.

D. Water Quality Limited Segment: A water quality limited segment is any waterbody, or definable portion of water body, where it is known that water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards. Indian Creek has been identified as a water quality limited segment. It has been listed for sediments, oil and grease, nutrients and dissolved oxygen.

Section 303(d) of the Clean Water Act (CWA) requires States to develop a Total Maximum Daily Load (TMDL) management plan for water bodies determined to be water quality limited. A TMDL documents the amount of a pollutant a waterbody can assimilate without violating a State's water quality standards and allocates that load capacity to known point sources and nonpoint sources. Idaho Division of Environmental Quality is proposing to complete a TMDL for Indian

Creek by December 31, 2000. A condition has been included in the proposed permit which will allows the permit to be modified to incorporate the TMDL when it is completed.

IV. Description of Facility and Discharge

The Nampa wastewater treatment plant consists of grit and screening removal, two primary clarifiers, three trickling filters, three secondary clarifiers, nitrification activated sludge process, two final clarifiers, chlorination then dechlorination and post aeration. Sludge (biosolids) from the wastewater treatment facility is anaerobically digested in a two-stage process. The facility then provides the dewatering options of drying beds, belt filter press, or storage in a holding lagoon. The facility produces Class B biosolids which are usually applied to land, in southeastern Canyon County, in liquid form with sludge trucks. Detailed records are kept of biosolids applications. Digester sludge from the Nampa facility is also sent to Darigold in Boise, Idaho. The digester sludge is blended in the Darigold digester to enhance microbial activity.

The wastewater treatment plant has a design flow of 11.76 MGD (18 cfs), design nitrogen removal of 85%, 5-day biological oxidation demand (BOD_5) and total suspended solids (TSS) removal rates of 85%.

A review of the discharge monitoring reports (DMRs) from 1992 through 1997 shows the facility has been in compliance with the requirements of its current NPDES permit limits.

V. Basis for Permit Conditions

A. General Approach

Sections 101, 301(b), 304, 308, 401, 402 and 405 of the Clean Water Act (CWA) provide the basis for the effluent limitations and other conditions in the draft permit. EPA evaluates discharges with respect to these sections of the CWA and the relevant NPDES regulations in determining which conditions to include in the permit.

The CWA requires Publicly Owned Treatment Works (POTWs) to meet performance-based requirements based on available wastewater treatment technology. Section 301 of the CWA established a required performance level, referred to as "secondary treatment," that all POTWs were required to meet by July 1, 1977. EPA developed "secondary treatment" regulations which are specified in 40 CFR §133. These technology-based limits apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of BOD, TSS, and pH.

EPA may find, by analyzing the effect of a discharge on the receiving water, that technology based permit limits are not sufficiently stringent to meet water quality standards. In such cases, EPA regulations at 40 CFR §122.44(d)(1) require the development of more stringent, water quality-based limits (WQBELs) designed to

ensure that water quality standards are met. The proposed permit limits reflect whichever limits (technology-based or water quality-based) are most stringent.

Under Section 308 of the CWA and 40 CFR §122.44(I), EPA must include monitoring requirements in the permit to determine compliance with effluent limitations. Effluent and ambient monitoring may also be required to gather data for future effluent limitations or to monitor effluent impacts on receiving water quality. Monitoring frequencies are based on the nature and effect of the pollutant, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance.

B. Technology-Based Evaluation

1. BOD_5 and TSS Concentration Limitations: Secondary treatment standards are defined in the federal regulations at 40 CFR §133.102 (state regulations at IDAPA 16.01.02.420) as follows:

Parameter	Monthly Average	Weekly Average	Percent Removal
Biochemical Oxygen Demand ($BOD_{5)}$	30 mg/L	45 mg/L	85%
Total Suspended Solids (TSS)	30 mg/L	45 mg/L	85%

These effluent limitations are in the current permit and will be retained in the draft permit.

2. BOD_5 and TSS Loading Limitations: In accordance with federal regulations (40 CFR § 122.45 (f)), the secondary treatment requirements must be expressed as mass based limits using the design flow of the facility. In the current permit, the loading limitations were based on the design flow of the facility, therefore, the loading limits from the current permit will be retained in the proposed permit.

3. pH: The technology-based pH limitation for POTW's is defined in the federal regulations 40 CFR §133.102. The pH of the effluent is required to be within the range of 6.0 to 9.0 standard units.

4. Fecal coliform bacteria: The technology-based fecal coliform bacteria limitation for POTW's is defined in Idaho's water quality standards (IDAPA 16.01.02.420.05.). Fecal coliform concentrations in secondary treated effluent must not exceed a geometric mean of 200/100 ml based on no more than one week's data and a minimum of five samples.

C. Water Quality-Based Evaluation

1. Statutory Basis for Water Quality-Based Limits

Section 301(b)(1)(C) of the CWA requires the development of limitations in permits necessary to meet water quality standards by July 1, 1977. Discharges to state waters must also comply with limitations imposed by the state as part of its certification of NPDES permits under section 401 of the CWA.

The NPDES regulation (40 CFR § 122.44(d)(1)) implementing section 301 (b)(1)(C) of the CWA requires that permits include limits for all pollutants or parameters which "are or may be discharged at a level which will cause, have the reasonable potential to cause , or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality."

The regulations require that this evaluation be made using procedures which account for existing controls on point and nonpoint sources of pollution, the variability of the pollutant in the effluent, species sensitivity (for toxicity), and where appropriate, dilution in the receiving water. The limits must be stringent enough to ensure that water quality standards are met, and must be consistent with any available wasteload allocation.

The regulations also address when whole effluent toxicity (WET) and chemical-specific limits are required. A WET limit is required whenever the toxicity of the effluent has the reasonable potential to cause or contribute to an excursion above either a numeric or narrative standard for toxicity. The only exception is where chemical-specific limits will fully achieve the narrative standard. A chemical-specific limit is required whenever an individual pollutant is at a level of concern (as defined at 40 CFR 122.44(d)(1)) relative to the numeric standard for that pollutant.

2. Reasonable Potential Determination

When evaluating the effluent to determine if water quality based effluent limits (WQBELs) are needed based on chemical specific numeric criteria, a projection of the receiving water concentration (downstream of where the effluent enters the receiving water) for each pollutant of concern is made. If the projected concentration of the receiving water exceeds the applicable numeric criterion for a specific chemical, then there is a reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standards, and a WQBEL is required.

The effluent limits, in the current permit, for pH, fecal coliform bacteria, dissolved oxygen, total residual chlorine, and ammonia were compared with water quality standards to determine whether more stringent limits were necessary to ensure compliance with water quality standards. Additionally, the level of metals, whole effluent toxicity, temperature, and turbidity discharged by the wastewater

treatment facility were compared with water quality standards to determine if effluent limits needed to be incorporated into the proposed permit to ensure compliance with water quality standards.

3. Derivation of Water Quality Based Effluent Limit

In deriving the WQBELs, Region 10 applies the statistical permit limit derivation approach described in chapter 5 the *Technical Support Document for Water Quality-Based Toxics Control* (March, 1991, hereafter referred to as the TSD). This approach takes into account effluent variability, sampling frequency, and the difference in time frames between the water quality standards and monthly average and daily maximum limits. In addition to the numeric water quality criteria and dilution values, EPA used the following values in deriving limits, using the formulas in the TSD:

Probability value for long-term average calculation	99%
Probability value for monthly average limit calculation	95%
Probability value for daily maximum limit calculation	99%
Coefficient of variation for parameters of concern	Variable, see Appendix B
Frequency of monitoring for parameters of concern	Variable, see Appendix C

The limits which EPA is proposing in the draft permit for each parameter are discussed below.

(a) pH

The state water quality standard for pH is 6.5 - 9.5 standard units for the protection of aquatic life (IDAPA 16.01.02.250.02.i.). In the current permit, the effluent is required to be between 6.5 - 9.0 standard units. The lower end of the range reflects the state's requirement for the protection of water quality standards. The upper end of the range reflects the more stringent federal technology based requirement of 9.0 standard units (see Part V.B.3. of the fact sheet). The proposed permit will retain the pH range in the current permit.

(b) Fecal Coliform Bacteria

The current permit has a monthly limit of 200 colonies/100 ml and a weekly limit of 400 colonies/100 ml. The state water quality standards limit fecal coliform bacteria for waters protected for secondary contact recreation. Waters are not to contain fecal coliform bacteria in concentrations exceeding 800/100 ml at any time, and a geometric mean of 200/100 ml based on a minimum of 5 samples taken over a thirty day period (IDAPA 16.01.02.250.01.b.). As discussed previously, the technology-based requirement for fecal coliform bacteria states that the effluent must not exceed a weekly geometric mean of 200/100 ml based on one weeks data and a minimum of five samples.

The proposed permit incorporates the weekly fecal coliform bacteria limit of 200/100 ml (technology-based). To comply with Idaho water quality standards a maximum daily limit of 800/100 ml, and an average monthly limit of 200/100 ml will also be incorporated into the proposed permit.

The State of Idaho is contemplating changing the criteria for contact recreation. As such, the State has recommended that the effluent be monitored for E.Coli bacteria. The draft permit will require once per month monitoring for E.Coli bacteria.

(c) Dissolved Oxygen/Biochemical Oxygen Demand (BOD)

Dissolved Oxygen: Previously established effluent limitations for dissolved oxygen (D.O.) were based on Idaho Department of Health and Welfare, Division of Environment Staff Evaluations prepared as part of the Administrative Record for the August 1977 permit issuance and subsequent April 1979 permit modification [1]. The State required the D.O. levels in terms of percent saturation. The average monthly level was not to be less than 90%, and the average weekly level was not to be less than 80% . The effluent has consistently met these requirements.

The state water quality standards requires the level of D.O. to exceed 6 mg/L at all times for water bodies that are protected for aquatic life use. The D.O. level in the effluent has consistently met this requirement. The D.O. level has ranged from 6.9 mg/L to 9.3 mg/l, with an average of 7.9 mg/L. The percent saturation limits for dissolved oxygen will be retained from the previous permit.

Biochemical oxygen demand: BOD is a measure of the amount of oxygen required to stabilize organic matter in wastewater. It measures the total concentration of dissolved oxygen that would eventually be demanded as wastewater degrades in the stream. Therefore, the BOD loading from the wastewater treatment facility may impact downstream DO levels. Currently, there is insufficient data to determine if the BOD load from the facility is impacting the stream, therefore, monitoring requirements will be incorporated into the permit. The data collected will be used during the next permitting cycle (five year life of the permit or as appropriate if reopened for a TMDL) to determine if more stringent requirements are necessary for BOD.

(d) Total Residual Chlorine

The current permit has an average monthly chlorine limit of .4 mg/L, a weekly limit of .6 mg/L, and a maximum daily limit of .8 mg/L. A reasonable potential analysis indicates that the current discharge has the potential to violate the state water

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[1] Staff Evaluation on Effluent Limitations for the City of Nampa; January 18, 1977; Mike Smith, IDHW-DEQ; and Final Revision of Effluent Limitations for the City of Nampa; March 8, 1979; Mike Smith, IDHW-DEQ.

quality standards (see Appendix B). The proposed permit will include an average monthly limit of 13 µg/L (1.3 lbs/day) and an maximum daily limit of 16 µg/L (1.6 lbs/day). For additional information on developing the effluent limitation see Appendix C.

The proposed water quality based effluent limits for chlorine fall below the level at which chlorine can be accurately quantified using EPA analytical test methods. In such cases it is difficult to determine compliance with the effluent limits. The inability to measure to the necessary level of detection is addressed by establishing the Minimum Level[2] (ML) as the compliance evaluation level for use in reporting Discharge Monitoring Report (DMR) data. Effluent discharges at or below the ML would be considered in compliance with the WQBEL.

In the absence of promulgated MLs, Interim MLs should be used. EPA believes that Interim ML values can be derived most effectively as a multiple of the existing method detection limit (MDL) value for a given analyte. The Interim ML is calculated as 3.18 X the published MDL for the analyte for a specific analytical method approved under Section 304(h) or previously approved for use by the permitting authority (Draft National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-based Effluent Limitations Set Below Analytical Detection/Quantitation Levels, March 1994); it is then rounded to the nearest multiple of 1, 2, 5, 10, 20 , 50, etc.

Therefore, in addition to the water quality based effluent limits an interim minimum level will be incorporated into the permit. The interim minimum level for chlorine is 20 µg/L. EPA will consider the permittee in compliance with the water quality based effluent limits for chlorine provided the effluent does not exceed the interim minimum level.

(e) Total Ammonia

Previously established effluent limitations for total ammonia were based on Idaho Department of Health and Welfare, Division of Environment Staff Evaluations prepared as part of the Administrative Record for the August 1977 permit issuance and subsequent April 1979 permit modification [3]. Based on the State's analysis an average monthly ammonia limit of 1.8 mg/L, a weekly limit of 2.9 mg/L, and a daily maximum of 7.2 mg/L were incorporated into the permit. These limits were

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[2] Minimum Level - the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method-specified sample weights, volumes, and processing steps have been followed.

[3] Staff Evaluation on Effluent Limitations for the City of Nampa; January 18, 1977; Mike Smith, IDHW-DEQ; and Final Revision of Effluent Limitations for the City of Nampa; March 8, 1979; Mike Smith, IDHW-DEQ.

based on the following assumptions and equation:

- Chronic criteria = .842 mg/L (based on pH = 7.8 and temperature = 20°C)
- 1Q10 = 24.7 cfs
- Nampa design flow = 18.4 cfs
- Background NH3-N = 0.15 mg/L

(24.7)(0.15 + (18.4)(X) = (43.1)(0.842)
X = NH3-N = 1.8 mg/L

A reasonable potential analysis was conducted by EPA to ensure that the effluent limits in the current permit do not violate the State's water quality standards. The following assumptions were used:

- pH = 7.9 standard units
- Temperature = 20°C
- 1Q10 = 15.7 cfs
- 7Q10 = 16.1 cfs
- acute criterion = 6.8 mg/L (total ammonia)
- chronic criterion = 1.1 mg/L (total ammonia)
- allow a 25% mixing zone
- Nampa design flow = 18.4 cfs
- Background concentration = .4 mg/L

The 1Q10 flow and the background concentration of ammonia used by EPA are significantly different from the flow and concentration used by the State in 1977. EPA calculated the 1Q10 and 7Q10 using flow data from the USGS gaging station located above the Nampa wastewater treatment facility. The background concentration of ammonia was determined by using data collected upstream from the facility from January 1996 through August 1997. The 95th percentile value of the data set was used.

Using these assumptions it was found that discharging at the effluent limits allowed in the current permit would violate the acute and chronic criteria (see appendix B). Therefore, the WQBELs were recalculated. An average monthly limit of 1 mg/L (98 lbs/day) and a maximum daily limit of 2 mg/l (196 lbs/day) will be incorporated into the proposed permit (see Appendix C).

(f) Arsenic and Metals

The metals of concern in the effluent are arsenic, cadmium, chromium, copper, lead, nickel, and zinc. The reasonable potential calculation for each of these parameters indicates a WQBEL is not required at this time (see Appendix B).

While the reasonable potential calculation indicated that WQBELs were not required, this determination was made using the assumption that the ambient background levels of these pollutants were zero. This is significant because as the

ambient level of a pollutant increases the chance that the effluent will cause an exceedance of the water quality standard will also increase. Ambient monitoring for metals will be included in the proposed permit and this information will be used in the reasonable potential calculation during the next permitting cycle to determine if WQBELs are needed. If the facility continues to discharge lead and cadmium at its present levels, it is likely WQBELs for these parameters will be included in the next permitting cycle.

(g) Whole Effluent Toxicity (WET)/No Toxics Substances in Concentrations that Impair Designated Uses

The state water quality standards require surface waters of the State to be free from toxic substances in concentrations that impair use classifications. Data do not exist to support the development of a WET limit at this time. The proposed permit will require the permittee to monitor for WET, and this information will be used in the next permitting cycle to determine if a WET limit is required.

(h) Temperature

The state water quality standards require ambient water temperatures of twenty-two (22) degrees C or less with a maximum daily average of no greater than nineteen (19) degrees C.

The City of Nampa has collected temperature data downstream from the facility's outfall. Current data indicates the maximum instantaneous temperature downstream of the outfall is 21.1°C. The data are insufficient to determine if the daily average temperature requirement is being met. Therefore, a limit for temperature will not be included in the permit at this time, however, ambient and effluent monitoring for temperature will be included in the proposed permit. IDEQ has requested that weekly monitoring for temperature (at the hottest time of the day) be included in the proposed permit. Additionally, they have requested that once per month temperature be monitored hourly for a twenty four hour period. These requirements have been incorporated into the proposed permit.

(i) Turbidity

The state water quality standards require that turbidity not exceed background turbidity by more than fifty (50) NTU instantaneously or more than twenty five (25) NTU for more than ten (10) consecutive days. Data do not exist to support the development of a turbidity limit at this time. The proposed permit will require the permittee to monitor for turbidity, and this information will be used in the next permitting cycle to determine if a limit is required.

(j) Floating, Suspended or Submerged Matter

The state water quality standards requires surface waters of the State to be free from floating, suspended, or submerged matter of any kind in concentrations

causing nuisance or objectionable conditions or that may impair designated beneficial uses. This requirement is a condition of the current permit and will be retained in the proposed permit.

(k) Nutrients

The state water quality standards require surface waters of the State to be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated uses. Data do not exist to support the development of nutrient (i.e. phosphorus) limits at this time. The proposed permit will require the permittee to monitor for nutrients, and to develop a study to determine if excess nutrients are impairing water quality. Additionally, IDEQ requested that nutrient monitoring be weekly upstream and downstream of the discharge. This information will be used in the next permitting cycle to determine if a limit is required.

D. Pretreatment Program Requirements

The non-domestic flow from the Nampa wastewater treatment facility is about 47% of the total flow; the flow from the significant industrial users is about one third of that or about 16% of the total flow. The significant industrial users are:

Boise-Cascade--Corrugated Container Division
Carlisle Spring Brake Products, Inc.
Carnation Processed Potatoes
Environmental Oil Services Co. L.L.C.
Great American Breaded Vegetable
Micron Custom Manufacturing Service Inc
Pacific Hide and Fur
Simplot Meat Products
The Amalgamated Sugar Company
Valley Linen & Supply
Zilog, Inc. Mod I & II
Zilog, Inc. Mod III

In February 1982, the City of Nampa submitted a formal pretreatment program application that met the requirements of 40 CFR §403. The program was approved by EPA on July 1, 1982, and the city's NPDES permit was modified with pretreatment implementation conditions.

The facility developed local limits as part of the pretreatment program in 1987. Since that time, the water quality standards for Indian Creek have been revised to include the protection of cold water biota. An evaluation of the effluent indicates that the levels of cadmium and lead are close to exceeding the applicable instream criteria. Therefore, the proposed permit will require the permittee to re-evaluate the local limits in its pretreatment program. Additional pretreatment conditions in the proposed permit are much the same as in the current permit; they include

semi-annual sampling of the influent, effluent, and final sludge; submittal of a pretreatment annual report; and program management requirements

The city's pretreatment program has been evaluated on an annual basis through on-site visits and review of the annual pretreatment reports. Program modifications have been submitted to EPA for review and approval. These modifications include improvements to the city's enforcement response guidelines and modifications of the sewer use ordinance to incorporate changes required by federal regulations.

E. Sludge (Biosolids) Management Requirements

1. General

The biosolids management regulations of 40 CFR §303 were designed so that the standards are directly enforceable against most users or disposers of biosolids, whether or not they obtain a permit. Therefore, the publication of Part 503 in the *Federal Register* on February 19, 1993 served as notice to the regulated community of its duty to comply with the requirements of the rule, except those requirements that indicate that the permitting authority shall specify what has to be done.

Even though Part 503 is largely self-implementing, Section 405(f) of the CWA requires the inclusion of biosolids use or disposal requirements in any NPDES permit issued to a Treatment Works Treating Domestic Sewage (TWTDS). In addition, the biosolids permitting regulations in 40 CFR §122 and §124 have been revised to expand its authority to issue NPDES permits with these requirements. This includes all biosolids generators, biosolids treaters and blenders, surface disposal sites and biosolids incinerators. Therefore, the requirements of 40 CFR §503 have to be met when biosolids is applied to the land, placed on a surface disposal site, placed on a municipal solid waste landfill (MSWLF) unit, or fired in a biosolids incinerator.

Requirements are included in Part 503 for pollutants in biosolids, the reduction of pathogens in biosolids, the reduction of the characteristics in biosolids that attract vectors, the quality of the exit gas from a biosolids incinerator stack, the quality of biosolids that is placed in a MSWLF unit, the sites where biosolids is either land applied or placed for final disposal, and for a biosolids incinerator. The sections of the federal standards at 40 CFR §503 applicable to this facility’s proposed practices are Section A (General Provisions, 503.1-9), Section B (Land Application, 503.10-18), and Section D (Pathogen & Vector Control, 503.30-33).

2. Biosolids Management

The permittee produces and distributes Class B biosolids for use on agricultural land in southeastern Canyon County. Class B biosolids is

applied as a soil amendment product. The permittee has submitted, to EPA, land application plans for sites where biosolids are being applied as a fertilizer or soil amendment to land (see Appendix D).

The permittee also sends digester sludge from the Nampa facility to Darigold in Boise, Idaho. The digester sludge is blended in the Darigold digester to enhance microbial activity.

For land application sites being used for the distribution of biosolids the proposed permit (1) defines the area where biosolids may be distributed, (2) establishes limitations for ten metals, (3) establishes pathogen reduction requirements, and (4) establishes vector control requirements.

3. Permit Requirements

To ensure compliance with the CWA and the federal standards for the use or disposal biosolids (40 CFR 503), the proposed permit contains the following requirements:

a. State Laws and Future Federal Standards: Pursuant to 40 CFR 122.41(a), a condition has been incorporated into the proposed permit requiring the Permittee to comply with all existing federal and state laws, and all regulations applying to biosolids use and disposal. These standards shall be interpreted using the proposed permit and the specific EPA guidance documents listed in paragraph b, below. These documents are used by EPA Region 10 as the primary technical references for both permitting and enforcement activities.

b. Health and Environmental General Requirement: The CWA requires that the environment and public health be protected from toxic effects of any pollutants in biosolids. Therefore, the Permittee must handle and use/dispose of biosolids in such a way as to protect human health and the environment. Under this requirement the permittee is responsible for being aware of all pollutants allowed to accumulate in the biosolids, and for preventing harm to the public from those pollutants.

The U.S. Department of Agriculture can assist the facility in evaluating potential nutrient or micronutrient problems. Additionally, EPA has published the following guidance to assist facilities in evaluating their biosolids for pollutants other than those listed in 40 CFR §503: *Part 503 Implementation Guidance*, EPA 833-R-95-001, and *Environmental Regulations and Technology: Control of Pathogens and Vector Attraction in Sewage Sludge*, EPA/625/R-92/013.

c. Protection of Surface Waters from Biosolids Pollutants: Section 405(a) of the CWA prohibits any practice where biosolids pollutants removed in a treatment works at one location would ultimately enter surface waters at another location. Under this requirement the Permittee must protect surface waters from metals, nutrients, and pathogens contained in the biosolids.

d. Responsibility for Land Application: 40 CFR §503.7 of the biosolids regulations specify that generators are responsible for correct use or disposal of their biosolids. For purposes of this permit and for purposes of compliance with the 40 CFR §503 regulations, the permittee is considered the "person who applies biosolids to the land" under the land application regulations. All haulers, contractors, farmers, or others who might be involved in the land application process or in post-application control of the land and the crops are considered agents for the permittee, for determination of compliance with the permit and for determination of compliance with the 40 CFR §503 regulations (which are self-implementing).

e. Control of Pathogens, Vectors, and Metals: The regulations allow alternative methods and measurements for preparing Class B biosolids. The proposed permit establishes basic standards that the biosolids must meet for metals, pathogens, and vector control. Additionally, the proposed permit allows the Permittee to use alternative standards which are available under the regulations. The permittee must submit written notice to EPA 90 days in advance of using an alternative standard.

f. Biosolids Use/Disposal Practices: The permit application indicates the facility land applies its biosolids, and transfers biosolids to other facilities, therefore, these practices are authorized in the proposed permit. For authorized land application sites see Appendix D.

The application indicates that the facility does not receive biosolids from other treatment works, or dispose of its biosolids in a municipal solid waste landfill, therefore the permit prohibits these activities.

g. Crop Trials: Optimum loading rates, application methods, crop responses, environmental impacts, cost-effectiveness, and other agricultural practices may vary with different crops and from site to site when using biosolids as a soil amendment. Applying biosolids to areas of land two acres or less facilitates the development of appropriate agricultural practices when using biosolids as a soil amendment.

The permit authorizes the distribution of biosolids on areas of land two acres or less for the purpose of optimizing agricultural practices. The land used for crop trials does not need to be within the authorized land application sites (see Appendix D for land application sites).

The permittee must notify the Environmental Protection Agency, Idaho Operations Office, the Idaho Division of Environmental Quality, Southwest Idaho Regional Office, and the Natural Resources Conservation Service of the U.S. Department of Agriculture nearest the area of the site when distributing biosolids for crop trials outside the authorized land application sites.

h. Reporting: At a minimum, 40 CFR 503.18 specifies that certain facilities report annually the information that they are required to develop and retain under the record keeping requirements (40 CFR 503.17). This requirement applies to permittee defined as Class I management facilities, POTWs with a flow rate equal to or greater than one mgd, and POTWs serving a population of 10,000 or greater. The following information should be included to improve the reliability of the report: (1) units for reported concentrations, (2) dry weight concentrations, (3) number of samples collected during the monitoring period, (4) number of excursions during the monitoring period, (5) sample collection techniques, and (6) analytical methods.

F. Monitoring Requirements

The following monitoring requirements have been included in the permit pursuant to section 308 of the CWA and 40 CFR §122.44(I). Monitoring frequencies are based on the nature and effect of the pollutants, as well as a determination of the minimum sampling necessary to adequately monitor the facility's performance.

1. Influent and Effluent Monitoring: The proposed permit requires monitoring for the following parameters.

Parameter	Sample Location	Sample Frequency	Sample Type
Flow, mgd	Effluent	Continuous	Recording
$BOD_{5,}$ mg/L	Influent and Effluent	1/week	24 hour composite
TSS, mg/L	Influent and Effluent	1/week	24 hour composite
Fecal Coliform Bacteria, colonies/100 ml	Effluent	5/week	grab
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Parameter	Sample Location	Sample Frequency	Sample Type
E. Coli Bacteria	Effluent	1/month	grab
Total Residual Chlorine, mg/L	Effluent	5/week	grab
pH, standard units	Effluent	5/week	grab
Ammonia as N, mg/L	Effluent	1/week	24 hour composite
Total Kjeldahl Nitrogen[1], mg/L	Effluent	1/week	24 hour composite
Nitrate-Nitrite as N[1], mg/L	Effluent	1/week	24 hour composite
Dissolved Oxygen, % saturation	Effluent	1/week	grab
Dissolved Oxygen[1], mg/L	Effluent	1/week	grab
Temperature[2], °C	Effluent	1/week	grab
Total Phosphorus[1], mg/L	Effluent	1/week	24 hour composite
Ortho-phosphate[1], mg/L	Effluent	1/week	24 hour composite
Turbidity[1], NTU	Effluent	1/week	24 hour composite
Oil and Grease[1], mg/L	Effluent	1/week	24 hour composite
Arsenic[1], µg/L	Effluent	1/month	24 hour composite
Cadmium[1], µg/L	Effluent	1/month	24 hour composite
Chromium, µg/L	Effluent	1/month	24 hour composite
Copper[1], µg/L	Effluent	1/month	24 hour composite
Lead[1], µg/L	Effluent	1/month	24 hour composite
Mercury[1] µg/L	Effluent	1/month	24 hour composite
Nickel[1], µg/L	Effluent	1/month	24 hour composite
Zinc[1], µg/L	Effluent	1/month	24 hour composite
WET, TU_c	Effluent	2/year	24 hour composite

1. These parameters shall be analyzed for a period of two years, starting 90 days from the effective date of the permit. Arsenic, cadmium, copper, chromium, lead, and zinc shall be monitored as the total recoverable. Mercury shall be monitored as total.
2. Temperature should be taken during the hottest part of the day.

2. Ambient Monitoring

The proposed permit requires the permittee to implement a receiving water monitoring program. The data collected will be used in the next permitting cycle to ensure water quality standards are being achieved. The receiving water monitoring shall start 90 days from the effective date of the permit and last for a period of two years.

Weekly monitoring will be required for those parameters where it is known that Indian Creek and/or the Boise River (where Indian Creek enters the Boise River) do not meet the applicable water quality standards, and/or is not exprected to meet the applicable water quality standards. These parameters include sediments, oil and grease, nutrients, dissolved oxygen, fecal coliform bacteria and temperature. All other parameters shall be monitored monthly. The following parameters shall be sampled:

Parameter	Upstream Monitoring	Downstream Monitoring
Flow, mgd	Recording	N/A
$BOD_{5,}$ mg/L	Grab	N/A
TSS, mg/L	Grab	N/A
Fecal Coliform Bacteria, colonies/100 ml	Grab	N/A
Dissolved Oxygen, mg/L	Grab	Grab
Total Phosphorus, mg/L	Grab	Grab
Ortho-phosphate, mg/L	Grab	Grab
Total Ammonia as N, mg/L	Grab	Grab
Total Kjeldahl Nitrogen, mg/L	Grab	Grab
Nitrate-Nitrite as N, mg/L	Grab	Grab
Temperature, °C	Grab	Grab
pH, standard units	Grab	Grab
Hardness, mg/L as $CaCO_3$	Grab	Grab
Oil and Grease, mg/L	Grab	N/A
Turbidity, NTU	Grab	Grab
Arsenic, µg/L, dissolved	Grab	N/A
Cadmium, µg/L, dissolved	Grab	N/A
Chromium, µg/L	Grab	N/A

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Parameter	Upstream Monitoring	Downstream Monitoring
Copper, µg/L, dissolved	Grab	N/A
Lead, µg/L, dissolved	Grab	N/A
Mercury, µg/L, total	Grab	N/A
Nickel, µg/L, dissolved	Grab	N/A
Zinc, µg/L, dissolved	Grab	N/A

3. Temperature Monitoring: To evaluate daily average temperature conditions a condition has been incorporated into the permit that requires the permittee to monitor temperature hourly for a twenty four hour period. Monitoring is to occur once per month at the effluent, the upstream monitoring station and the downstream monitoring station.

4. Method Detection Limits

During the next permitting cycle the need for incorporating water quality based effluent limits into the permit will be re-evaluated. In order to assess if the water quality of Indian Creek is being impacted by the effluent from Nampa, it is necessary to use analytical methods that have method detection limits below the water quality criteria. Therefore, the proposed permit requires the permittee to achieve the following method detection limits when analyzing samples:

Parameter	Method Detection Limit
Arsenic	2 µg/L
Cadmium	.5 µg/L
Chromium	2 µg/L
Copper	5 µg/L
Lead	1 µg/L
Mercury	.2 µg/L
Nickel	5 µg/L
Zinc	5 µg/L
Total residual chlorine	10 µg/L

G. Quality Assurance Plan

Under 40 CFR §122.41(e), the permittee must properly operate and maintain all facilities which it uses to achieve compliance with the conditions of the permit. This regulation also requires the permittee to ensure adequate laboratory controls and appropriate quality assurance procedures. Quality assurance requirements

apply to all monitoring requirements in the proposed permit including sample collection, handling, and shipment, on-site continuous and daily measurements, laboratory analysis, and data reporting and storage.

The draft permit requires the permittee to submit a quality assurance project plan to EPA within 90 days of the effective date of the permit. The plan is intended to address sampling techniques, sample preservation and shipment procedures, instrument calibration and preventive maintenance procedures, personnel qualifications and training, and analytical methods.

VI. Antidegradation

Indian Creek is a Tier I waterbody. In proposing to reissue this permit, EPA has considered Idaho's antidegradation policy (IDAPA 16.01.02.051.01). This provision states that "the existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected." The issuance of this permit will not result in the increase loading of pollutants. Therefore, the limits in the permit are consistent with Idaho's antidegradation policy.

VII. Other Legal Requirements

A. Endangered Species Act

Section 7 of the Endangered Species Act (ESA) requires federal agencies to request a consultation with the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USF&WS) regarding potential effects an action may have on listed endangered species. In a letter dated October 24, 1997, the U.S. Fish and Wildlife Service identified the peregrin falcon as being a federally-listed endangered species. There are no proposed or candidate species in the area of the discharge.

In a letter dated October 21, 1997, the National Oceanic and Atmospheric Administration, National Marine Fisheries Service stated that the proposed discharge from the wastewater treatment plant is not within the designated critical habitat for listed Snake River Salmon, and critical habitat has not yet been designated for Snake River steelhead. There are no threatened species in the area of the discharge.

It is not likely that the proposed permit will affect the peregrin falcon, Snake River salmon or Snake River steelhead. EPA will provide NMFS and USF&WS with copies of the proposed permit and fact sheet during the public notice period. Any comments received from these agencies regarding this determination will be considered prior to reissuance of this permit.

B. State Certification

Because state waters are involved in this permitting action, the provisions of Section 401 of the CWA apply. In accordance with 40 CFR §124.10(c)(1), public notice of the draft permit has been provided to the State of Idaho agencies having jurisdiction over fish, shellfish, and wildlife resources.

As part of the certification, the State will be asked to certify the mixing zone used in calculating the effluent limitations in the proposed permit. If certification of the mixing zone is not provided, the limitations in the permit will be recalculated based on meeting water quality standards at the point of discharge.

C. Length of Permit

This permit shall expire five years from the effective date of the permit.

APPENDIX A
Criteria Applicable To Indian Creek

Criteria for the protection of cold water biota:

1.

Parameter	Aquatic Life Criteria[1]		Human Health Criteria[2]
	Acute criteria	Chronic criteria	
Arsenic (µg/L)	360	190	50
Cadmium[3] (µg/L)	6.8	1.6	NA
Chromium[3] (µg/L)	887.6	293.4	NA
Copper[3] (µg/L)	29	18.4	NA
Lead[3] (µg/L)	118.8	4.6	NA
Nickel[3] (µg/L)	2294.4	253.6	4600
Zinc[3] (µg/L)	184.8	167.4	NA
Chlorine (µg/L)	19	11	NA
Ammonia[4] (mg/L)	5.65	1.0	NA

1. The acute and chronic aquatic life criteria for arsenic, cadmium, chromium, copper, lead, nickel, and zinc are expressed as the dissolved fraction of the metal.
2. The human health criteria are expressed as the total recoverable fraction of the metal.
3. The aquatic life criteria for cadmium, chromium, copper, lead, nickel, and zinc are hardness dependent. The 5th percentile ambient hardness value, of data collected from 8/20/97 through 10/23/97, was used to calculate the criteria. The 5th percentile hardness value is 176.6 mg/L as $CaCO_3$.
4. The ammonia criteria are from the Idaho Water Quality Standards at IDAPA 16.01.02.250.02.c.iii Tables III and IV. The ammonia criteria are dependent on ambient pH and temperature. The 95th percentile of the data collected upstream of the facility between January 1996 and August 1997 was used to determine the appropriate criteria. The 95th percentile of temperature and pH is 19° C and 8.0 standard units respectively.

2. pH values must be within the range of 6.5 - 9.5.

3. The total concentration of dissolved gas not exceeding 110% of saturation at atmospheric pressure at the point of sample collection.

4. Dissolved Oxygen Concentrations must exceed 6 mg/L at all times.

5. Water temperature must be 22°C or less with a maximum daily average of no greater than 19 °C .

6. Turbidity, below any applicable mixing zone set by the Department, shall not exceed background turbidity by more than 50 NTU instantaneously or more than 25 NTU for more than 10 consecutive days.

7. Surface waters shall be free from floating, suspended or submerged materials.

8. Surface waters shall be free from toxic substances in concentration that impair designated beneficial uses.

9. Surface waters of the state shall be free from excess nutrients that can cause visible slime growths or other nuisance aquatic growths impairing designated beneficial uses.

Criteria for the protection of secondary contact recreation:

1.

Parameter	Human Health Criteria
Arsenic (µg/L)	50
Nickel (µg/L)	4600

2. Fecal coliform bacteria are not to exceed:

   a. 800 colonies/100ml at any time; and
   b. 400 colonies/100 ml in more than 10% of the samples taken over 30 days; and
   c. a geometric mean of 200 colonies/100 ml based on a minimum of 5 samples taken over a thirty day period.

3. Surface waters shall be free from floating, suspended or submerged materials.

4. Surface waters shall be free from toxic substances in concentration that impair designated beneficial uses.

Criteria for the protection of agricultural use:

Parameter	Livestock Criteria	Irrigation Criteria
Arsenic (µg/L)	200	100
Cadmium (µg/L)	50	10
Chromium (µg/L)	1000	100

Copper (µg/L)	500	200
Lead (µg/L)	50	5000
Nickel (µg/L)	NA	200
...CONTINUED ON NEXT PAGE...		
Parameter	Livestock Criteria	Irrigation Criteria
Zinc (µg/L)	25000	2000
Nitrates & Nitrites (mg/L)	100	NA
Nitrites (mg/L)	10	NA
NOTE: NA = not applicable		

2. Surface waters shall be free from floating, suspended or submerged materials.

3. Surface waters shall be free from toxic substances in concentration that impair designated beneficial uses.

APPENDIX B
Reasonable Potential Determination

To determine if a water quality based effluent limitation is required, the receiving water concentration of pollutants is determined downstream of where the effluent enters the receiving water. If the projected receiving water concentration is greater than the applicable numeric criterion for a specific pollutant, there is reasonable potential that the discharge may cause or contribute to an excursion above the applicable water quality standard and an effluent limit must be incorporated into the NPDES permit.

The receiving water concentration is determined using the following mass balance equation.

$C_d \times Q_d = (C_e \times Q_e) + (C_u \times Q_u)$

$$C_d = \frac{(C_e \times Q_e) + (C_u \times Q_u)}{Q_d}$$

where,
C_d = receiving water concentration downstream of the effluent discharge
Q_d = receiving water flow downstream of the effluent discharge
C_e = maximum projected effluent concentration
Q_e = maximum effluent flow
C_u = upstream concentration of pollutant
Q_u = upstream flow

Mixing Zone/Flow Conditions

The Idaho *Water Quality Standards and Wastewater Treatment Requirements* at IDAPA 16.01.02060 allow twenty-five percent (25%) of the receiving water to be used for dilution for aquatic life criteria. One hundred percent (100%) of the receiving water can be used for dilution for human health criteria. The flows used to evaluate compliance with the criteria are:

- The 1 day, 10 year low flow (1Q10) is used for the protection of aquatic life from acute effects. It represents the lowest daily flow that is expected to occur once in 10 years. The 1Q10 for Indian Creek is 15.7 cfs.

- The 7 day, 10 year low flow (7Q10) is used for the protection of aquatic life from chronic effects. It the lowest 7 day average flow expected to occur once in 10 years. The 7Q10 for Indian Creek is 16.1 cfs.

- The 30 day, 5 year low flow (30Q5) is used for the protection of human health from non-carcinogens. It represents the 30 day average flow expected to occur once in 5 years. The 30Q5 for Indian Creek is 17.7 cfs.

- The harmonic mean flow is a long-term average flow and is used for the protection of human health from carcinogens.. It is the number of daily flow measurements divided

by the sum of the reciprocals of the flows. The harmonic mean flow is 36.8 cfs. The harmonic mean was also used for the protection of agriculture.

In accordance with state water quality standards, only the Idaho Division of Environmental Quality may authorize mixing zones. The reasonable potential calculations are based on a mixing zone of 25% for aquatic life and 100% for human health and agriculture. If the State does not authorize a mixing zone in its 401 certification, the permit limits will be re-calculated to ensure compliance with the standards at the point of discharge.

If a mixing zone (%MZ) is allowed, the mass balance equation becomes

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

NOTE: $Q_d = Q_e + (Q_u \times \%MZ)$

Maximum Projected Effluent Concentration

When determining the projected receiving water concentration, EPA's *Technical Support Document for Water Quality-based Toxics Controls* (TSD, 1991) recommends using the maximum projected effluent concentration. To determine the maximum projected effluent concentration (C_e) EPA has developed a statistical approach to better characterize the effects of effluent variability. The approach combines knowledge of effluent variability as estimated by a coefficient of variation (CV) with the uncertainty due to a limited number of data to project an estimated maximum concentration for the effluent. Once the CV's for each parameter have been calculated, the reasonable potential multiplier used to derive the maximum projected effluent concentration (C_e) can be found in Table 3-1 of EPA's TSD.

The maximum projected concentration (C_e) for the effluent is equal to the 95th percentile observed concentration value (or the highest observed value if the 95th percentile cannot be calculated) of the data set multiplied by the reasonable potential multiplier.

The following table summarizes the CV's, reasonable potential multipliers, 95th percentile effluent concentration and maximum projected concentration (C_e) for each parameter.

TABLE 1

Parameter	Coefficient of Variation[1] (CV)	Reasonable Potential Multiplier	95th Percentile effluent concentration, µg/L	Maximum Projected Effluent Concentration[4] (C_e), µg/L
Arsenic	.15	1.3	7	9.1
Cadmium	.16	1.3	.64	.8
Chromium	.62	2.9	31.7	91.1
Copper	N/A[2]	1.0	10	10

Lead	.3	1.7	3.2	5.4
Nickel	.13	1.3	4	5.2
Zinc	.7	1.2	52.2	62.6
Ammonia[3]	.8	---	---	7200
Chlorine	.13	1.0	400	400

1. The CV for chlorine and ammonia was calculated using effluent data collected from January 1996 through August 1997. Effluent data for metals has been collected yearly, however beginning in January of 1995 the facility started using more sensitive analytical methods, therefore only data from 1/23/95 through 6/19/96 was used to calculate the CV.
2. Data was either at the method detection limit or below it, therefore, a CV could not be calculated.
3. The current permit allows the facility to discharge at an maximum concentration of 7200 µg/L. The facility has been discharging at levels significantly below this concentration. Since the current permit allows a discharge at this concentration, this value needs to be evaluated to determine if there is a reasonable potential to violate water quality standards.
4. The maximum projected effluent concentration for As,Cd, Cr, Cu, Pb, Ni, and Zn is expressed as the total.

Dissolved vs Total Metals

When determining the reasonable potential of these parameters to violate water quality standards the projected receiving water concentration is compared to the criteria. The aquatic life criteria for arsenic, cadmium, chromium, copper, lead, nickel and zinc are expressed as dissolved. The maximum projected receiving water concentration is expressed as total.

The dissolved metal is the concentration of an analyte that will pass through a 0.45 micron membrane filter assembly. Total metal is the concentration of analyte in an unfiltered sample. Comparing the projected receiving water cocentration, which is expressed as total, to a dissolved criterion is a conservative evaluation.

Reasonable Potential Calculations

Generally, the aquatic life and human health criteria are much more stringent than the agricultural criteria. Therefore, with the exception of chromium and nickel, calculations to determine if the effluent has a reasonable potential to violate the agricultural criteria have not been included.

1. Arsenic

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of arsenic, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

$$= \frac{(9.1 \times 18) + (0 \times (15.7 \times .25)}{18 + (15.7 \times .25)} = 7.5\ \mu g/L$$

Since 7.5 µg/L is less than the acute aquatic life criterion (360 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of arsenic, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

$$= \frac{(9.1 \times 18) + (0 \times (16.1 \times .25)}{18 + (16.1 \times .25)} = 7.4\ \mu g/L$$

Since 7.4 µg/L is less than the chronic aquatic life criterion (190 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(c) Determine if there is a reasonable potential for the human health criterion to be violated:

The upstream flow used to make the determination is the harmonic mean flow (36.8 cfs). Assume the State will allow a 100% mixing zone. There is no data available to determine the upstream concentration of arsenic, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

$$= \frac{(9.1 \times 18) + (0 \times (36.8)}{18 + (36.8 \times 1)} = 3.0\ \mu g/L$$

Since 3.0 µg/L is less than the human health criterion (50 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

2. CADMIUM

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of cadmium, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(.8 \times 18) + (0 \times (15.7 \times .25)}{18 + (15.7 \times .25)} = 0.7\ \mu g/L$$

Since 0.7 µg/L is less than the acute aquatic life criterion (6.8 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of cadmium, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(.8 \times 18) + (0 \times (16.1 \times .25)}{18 + (16.1 \times .25)} = 0.7\ \mu g/L$$

Since .7 µg/L is less than the chronic aquatic life criterion (1.6 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

3. CHROMIUM

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of chromium, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(91.1 \times 18) + (0 \times (15.7 \times .25)}{18 + (15.7 \times .25)} = 74.8\ \mu g/L$$

Since 74.8 µg/L is less than the acute aquatic life criterion (887.6 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of chromium, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(91.1 \times 18) + (0 \times (16.1 \times .25))}{18 + (16.1 \times .25)} = 74.5 \text{ µg/L}$$

Since 74.5 µg/L is less than the chronic aquatic life criterion (293.4 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(c) Determine if there is a reasonable potential for the agricultural criterion to be violated:

The upstream flow used to make the determination is the harmonic mean flow (36.8 cfs). Assume the State will allow a 100% mixing zone. There is no data available to determine the upstream concentration of chromium, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(C_e \times Q_e) + (C_u \times (Q_u \times \%MZ))}{Q_e + (Q_u \times \%MZ)}$$

$$= \frac{(91.9 \times 18) + (0 \times (36.8 \times 1))}{18 + (36.8 \times 1)} = 30.2 \text{ µg/L}$$

The agricultural criterion has two criteria associated with it: one for livestock and one for irrigation. To protect for both irrigation and livestock the more stringent of the two criteria will be used. The irrigation criterion (100 µg/L) is the most restrictive. Since 30.2 µg/L is less than the agricultural criterion (100 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

4. COPPER

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of copper, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(10 \times 18) + (0 \times (15.7 \times .25)}{} = 8.2 \text{ µg/L}$$

18 + (15.7 X .25)

Since 8.2 µg/L is less than the acute aquatic life criterion (29 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of copper, therefore, an upstream concentration of zero will be assumed.

$C_d = \frac{(10 \times 18) + (0 \times (16.1 \times .25)}{18 + (16.1 \times .25)} = 8.2$ µg/L

Since 8.2 µg/L is less than the chronic aquatic life criterion (18.4 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

5. LEAD

(a) Determine if there is reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of lead, therefore, an upstream concentration of zero will be assumed.

$C_d = \frac{(5.4 \times 18) + (0 \times (15.7 \times .25)}{18 + (15.7 \times .25)} = 4.4$ µg/L

Since 4.4 µg/L is less than the acute aquatic life criterion (118.8 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of lead, therefore, an upstream concentration of zero will be assumed.

$C_d = \frac{(5.4 \times 18) + (0 \times (16.1 \times .25)}{} = 4.4$ µg/L

18 + (16.1 X .25)

Since 4.4 µg/L is less than the chronic aquatic life criterion (4.6 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

6. NICKEL

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of nickel, therefore, an upstream concentration of zero will be assumed.

$C_d = \frac{(5.2 \text{ X } 18) + (0 \text{ X } (15.7 \text{ X } .25)}{18 + (15.7 \text{ X } .25)} = 4.3$ µg/L

Since 4.3 µg/L is less than the acute aquatic life criterion (2294.4 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of nickel, therefore, an upstream concentration of zero will be assumed.

$C_d = \frac{(5.2 \text{ X } 18) + (0 \text{ X } (16.1 \text{ X } .25)}{18 + (16.1 \text{ X } .25)} = 4.3$ µg/L

Since 4.3 µg/L is less than the chronic aquatic life criterion (253.6 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(c) Determine if there is a reasonable potential for the human health criterion or the agricultural criterion to be violated:

The upstream flow used to make the determination is the 30Q5 flow (17.7 cfs). Assume the State will allow a 100% mixing zone. There is no data available to determine the upstream concentration of nickel, therefore, an upstream concentration of zero will be assumed.

$C_d = \frac{(C_e \text{ X } Q_e) + (C_u \text{ X } (Q_u \text{ X } \%MZ))}{}$

$$Q_e + (Q_u \text{ X } \%MZ)$$

$$= \frac{(5.2 \text{ X } 18) + (0 \text{ X } (17.7 \text{ X } 1)}{18 + (17.7 \text{ X } 1)} = 2.6 \text{ µg/L}$$

Since 2.6 µg/L is less than the human health criterion (4600 µg/L) and the agricultural criterion of 200 µg/L, there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

7. ZINC

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of zinc, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(62.6 \text{ X } 18) + (0 \text{ X } (15.7 \text{ X } .25)}{18 + (15.7 \text{ X } .25)} = 51.4 \text{ µg/L}$$

Since 51.4 µg/L is less than the acute aquatic life criterion (184.8 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of zinc, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(62.6 \text{ X } 18) + (0 \text{ X } (16.1 \text{ X } .25)}{18 + (16.1 \text{ X } .25)} = 51.2 \text{ µg/L}$$

Since 51.2 µg/L is less than the chronic aquatic life criterion (167.4 µg/L), there is no reasonable potential for the effluent to cause an exceedance to the water quality standard and an effluent limit is not required.

8 AMMONIA

(a) Determine if there is reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the

State will allow a 25% mixing zone. The current NPDES permit allows the facility to discharge at an maximum level of 7200 µg/L, therefore, this value will be used to determine if this effluent limit is protective of water quality standards. The 95th percentile upstream concentration of ammonia is 400 µg/L.

$$C_d = \frac{(7200 \times 18) + (400 \times (15.7 \times .25)}{18 + (15.7 \times .25)} = 5981 \text{ µg/L}$$

Since 5981 µg/L is greater than the acute aquatic life criterion (5650 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard, and a water quality based effluent limit is required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. The current NPDES permit allows the facility to discharge at a maximum level of 7200 µg/L, therefore, this value will be used to determine if this effluent limit is protective of water quality standards. The 95th percentile upstream concentration of ammonia is 400 µg/L.

$$C_d = \frac{(7200 \times 18) + (400 \times (16.1 \times .25)}{18 + (16.1 \times .25)} = 5957.3 \text{ µg/L}$$

Since 5957.3 is greater than the chronic aquatic life criterion (1000 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard, and a water quality based effluent limit is needed.

9. CHLORINE

(a) Determine if there is a reasonable potential for the acute aquatic life criterion to be violated:

The upstream flow used to make the determination is the 1Q10 (15.7 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of chlorine, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(400 \times 18) + (0 \times (15.7 \times .25)}{18 + (15.7 \times .25)} = 328.3 \text{ µg/L}$$

Since 328.3 µg/L is greater than the acute aquatic life criterion (19 µg/L), there is a reasonable potential for the effluent to cause an exceedance to the water quality standard. Therefore, a water quality based effluent limit is required.

(b) Determine if there is a reasonable potential for the chronic aquatic life criterion to

be violated:

The upstream flow used to make the determination is the 7Q10 (16.1 cfs). Assume the State will allow a 25% mixing zone. There is no data available to determine the upstream concentration of chlorine, therefore, an upstream concentration of zero will be assumed.

$$C_d = \frac{(400 \times 18) + (0 \times (16.1 \times .25)}{18 + (16.1 \times .25)} = 326.9 \text{ µg/L}$$

Since 326.9 µg/L is greater than the chronic aquatic life criterion (11 µg/L) , there is a reasonable potential for the effluent to cause an exceedance to the water quality standard. Therefore, a water quality based effluent limit is required.

APPENDIX C
Derivation of Water Quality Based Effluent Limitations

The purpose of a permit limit is to specify an upper bound of acceptable effluent quality. For water quality based requirements, the permit limits are based on maintaining the effluent quality at a level that will comply with the water quality standards, even during critical conditions in the receiving water (i.e., low flows). These requirements are determined by the wasteload allocation (WLA). The WLA dictates the required effluent quality which, in turn, defines the desired level of treatment plant performance or target Long-term average (LTA).

To support the implementation of EPA's national policy for controlling the discharge of toxicants, EPA developed the "Technical Support Document for Water Quality-Based Toxics Control" (EPA/505/2-90-001, March 1991). The following is a summary of the procedures recommended in the TSD in deriving water quality-based effluent limitations for toxicants. This procedure translates water quality criteria for chlorine and ammonia to "end of the pipe" effluent limits.

Step 1- Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$Q_dC_d = Q_eC_e + Q_uC_u$$

where,

Q_d =	downstream flow = $Q_u + Q_e$
C_d =	aquatic life criteria that cannot be exceeded downstream
Q_e =	effluent flow
C_e =	concentration of pollutant in effluent = WLA_{acute} or $WLA_{chronic}$
Q_u =	upstream flow
C_u =	upstream background concentration of pollutant

Rearranging the above equation to determine the effluent concentration (C_e) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{Q_dC_d - Q_uC_u}{Q_e}$$

when a mixing zone is allowed, this equation becomes:

$$C_e = WLA = \frac{C_d(Q_u \times \%MZ) + C_dQ_e}{Q_e} - \frac{Q_uC_u(\%MZ)}{Q_e}$$

where, %MZ is the mixing zone[4] allowable by the state standards. The Idaho water quality standards at IDAPA 16.01.02060 allow twenty-five percent (25%) of the receiving water to be used for dilution for aquatic life criteria. The effluent limits have been derived using Idaho's guidelines for mixing zone. However, establishing a mixing zone is a State discretionary function, if the State does not certify a mixing zone in the 401 certification process the effluent limits will be recalculated without a mixing zone.

$$\text{Chlorine } WLA_{acute} = \frac{C_d(Q_u \text{ X } \%MZ) + C_d Q_e - Q_u C_u (\%MZ)}{Q_e} \qquad Q_e$$

$$= \frac{19(15.7 \text{ X } .25) + (19 \text{ X } 18) - 15.7 \text{ X } 0\ (.25)}{18} = 23.1\ \mu g/L \qquad 18$$

$$\text{Chlorine } WLA_{chronic} = \frac{11(16.1 \text{ X } .25) + (11 \text{ X } 18) - 16.1 \text{ X } 0\ (.25)}{18} = 13.5\ \mu g/L \qquad 18$$

$$\text{Ammonia } WLA_{acute} = \frac{5.65(15.7 \text{ X } .25) + (5.65 \text{ X } 18) - 15.7 \text{ X.4 } (.25)}{18} = 6.8 \text{ mg/L} \qquad 18$$

$$\text{Ammonia } WLA_{chronic} = \frac{1.0(16.1 \text{ X } .25) + (1.0 \text{ X } 18) - 16.1 \text{ X } .4\ (.25)}{18} = 1.1 \text{ mg/L} \qquad 18$$

Step 2 - Determine the LTA

The acute and chronic WLAs are then converted to Long Term Average concentrations (LTA_a and LTA_c) using the following equations:

$LTA_{acute} = WLA_{acute} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$
where,
$\sigma^2 = \ln(CV^2 + 1)$
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation = standard deviation/mean; $CV_{chlorine}$ = .13; $CV_{ammonia}$ = .8
$LTA_{chronic} = WLA_{chronic} \text{ X } e^{[0.5\sigma^2 - z\sigma]}$
where,
$\sigma^2 = \ln(CV^2/4 + 1)$
z = 2.326 for 99th percentile probability basis
CV = coefficient of variation = standard deviation/mean

Calculate the LTA_{acute} and the $LTA_{chronic}$:

[4] Mixing zone - is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented. Only the State of Idaho has the regulatory authority to grant a mixing zone.

Chlorine LTA_{acute} = 17.1 µg/L
Chlorine $LTA_{chronic}$ = 11.7 µg/L

Ammonia LTA_{acute} = 1.7 mg/L
Ammonia $LTA_{chronic}$ = .5 mg/L

Step 3

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and $LTA_{chronic}$ is used to derive the effluent limitations. The TSD recommends using the 95^{th} percentile for the Average Monthly Limit (AML) and the 99^{th} percentile for the Maximum Daily Limit (MDL).

Step 4 - Determine the Permit Limits

1. The MDL and the AML would be calculated as follows:

$MDL = LTA_{chronic} \times e^{[z\sigma - 0.5\sigma^2]}$
where,
$\sigma^2 = \ln(CV^2 + 1)$
z = 2.326 for 99^{th} percentile probability basis
CV = coefficient of variation

$AML = LTA_{chronic} \times e^{[z\sigma - 0.5\sigma^2]}$
where,
$\sigma^2 = \ln(CV^2/n + 1)$
z = 1.645 for 95^{th} percentile probability basis
CV = coefficient of variation = standard deviation/mean
n = number of sampling events required per month for ammonia = 4
n = number of sampling events required per month for chlorine = 20

The following table lists the effluent limitations for Outfall 001:

Parameter	CV	$LTA_{chronic}$	$e^{[z\sigma - 0.5\sigma^2]}$ (for MDL)	$e^{[z\sigma - 0.5\sigma^2]}$ (for AML)	MDL	AML
Chlorine	.13	11.7 µg/L	1.34	1.004	16.0 µg/L	13.0 µg/L
Ammonia	.8	0.5 mg/L	4.009	1.8	2.0 mg/L	1.0 mg/L

2. The mass loading limitations for chlorine and ammonia are as follows:

a. Chlorine:
Monthly Average = (Monthly Concentration)(Design Flow Rate)(Conversion Factor)

where:
Monthly Concentration Limit = .013 mg/L
Design Flow Rate = 11.76 mgd
Conversion Factor = 8.34
Monthly Average = 1.3 lbs/day

Daily Maximum = (Daily Maximum Concentration)(Design Flow Rate) (Conversion Factor)

where:
Daily Maximum Concentration = .016 mg/L
Daily Maximum = 1.6 lbs/day

b. Ammonia:

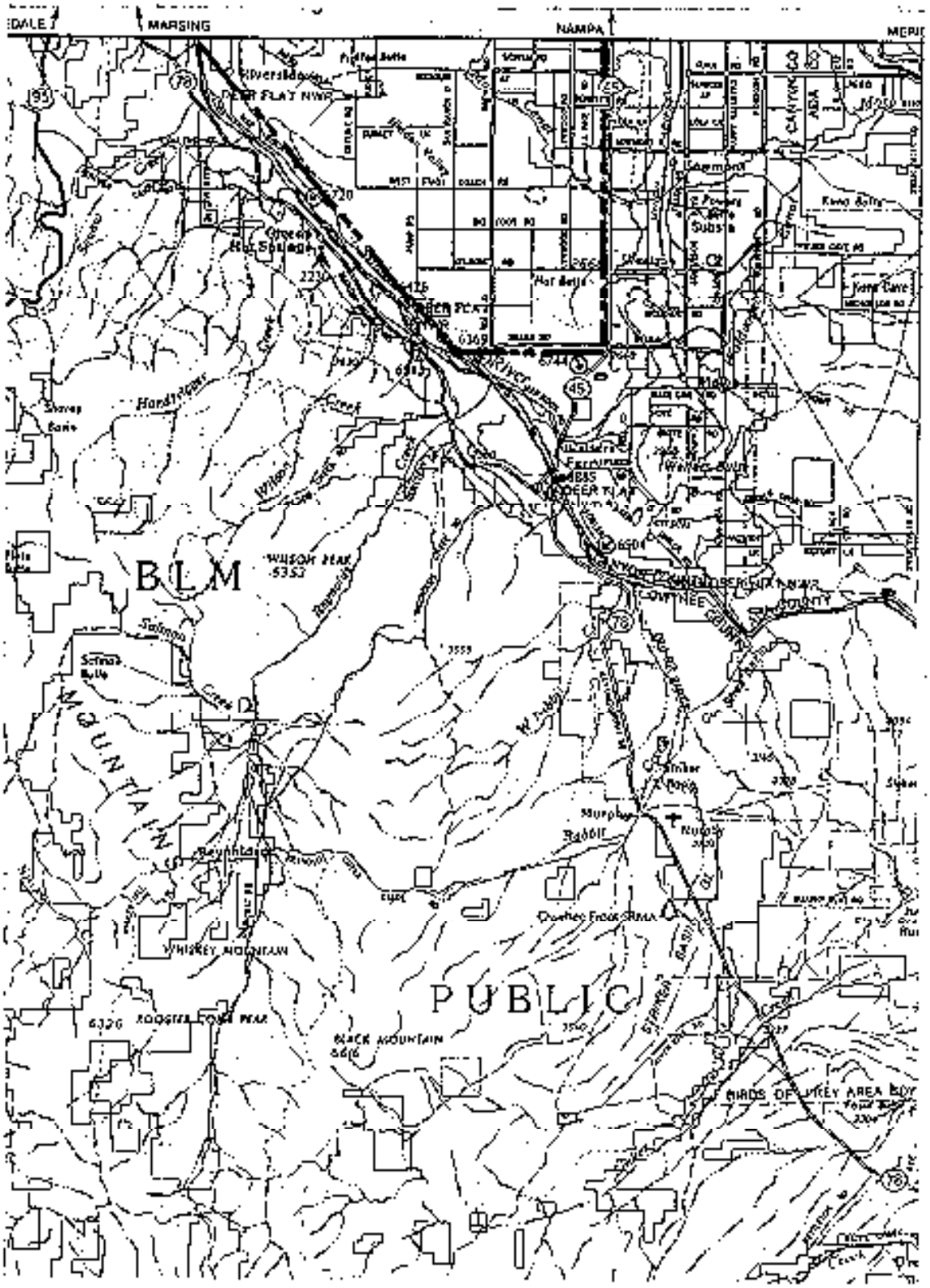
Monthly Average = (Monthly Concentration)(Design Flow Rate)(Conversion Factor)

where:
Monthly Concentration Limit = 1 mg/L
Design Flow Rate = 11.76 mgd
Conversion Factor = 8.34
Monthly Average = 98 lbs/day

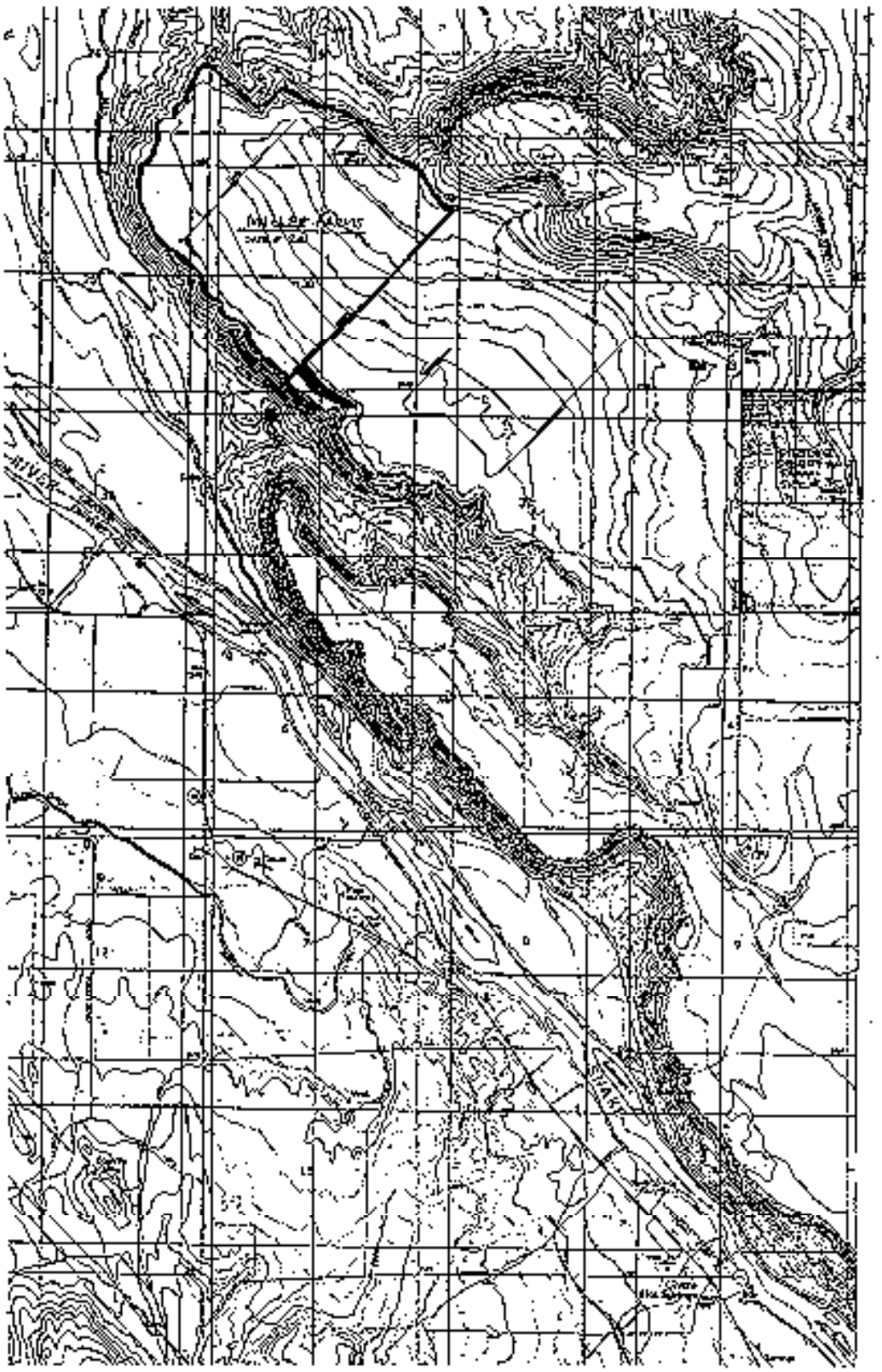
Daily Maximum = (Daily Maximum Concentration)(Design Flow Rate) (Conversion Factor)

where:
Daily Maximum Concentration = 2 mg/L
Daily Maximum = 196 lbs/day

APPENDIX D
Land Application Sites



General Boundary of Land Application Sites
(Boundaries are represented by dashed line)



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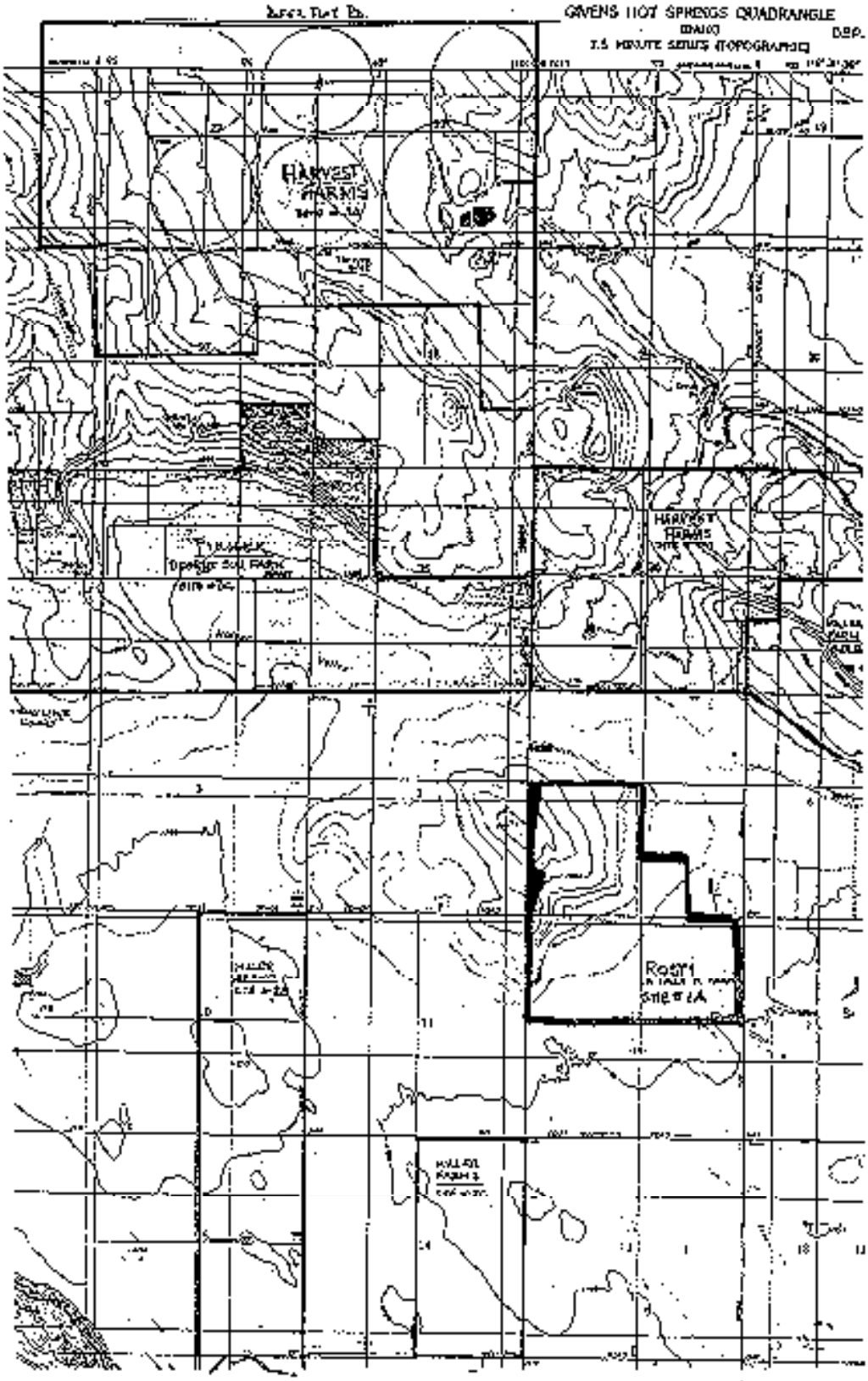
Specific Land Application Sites
(Boundaries are represented by dark, solid lines)



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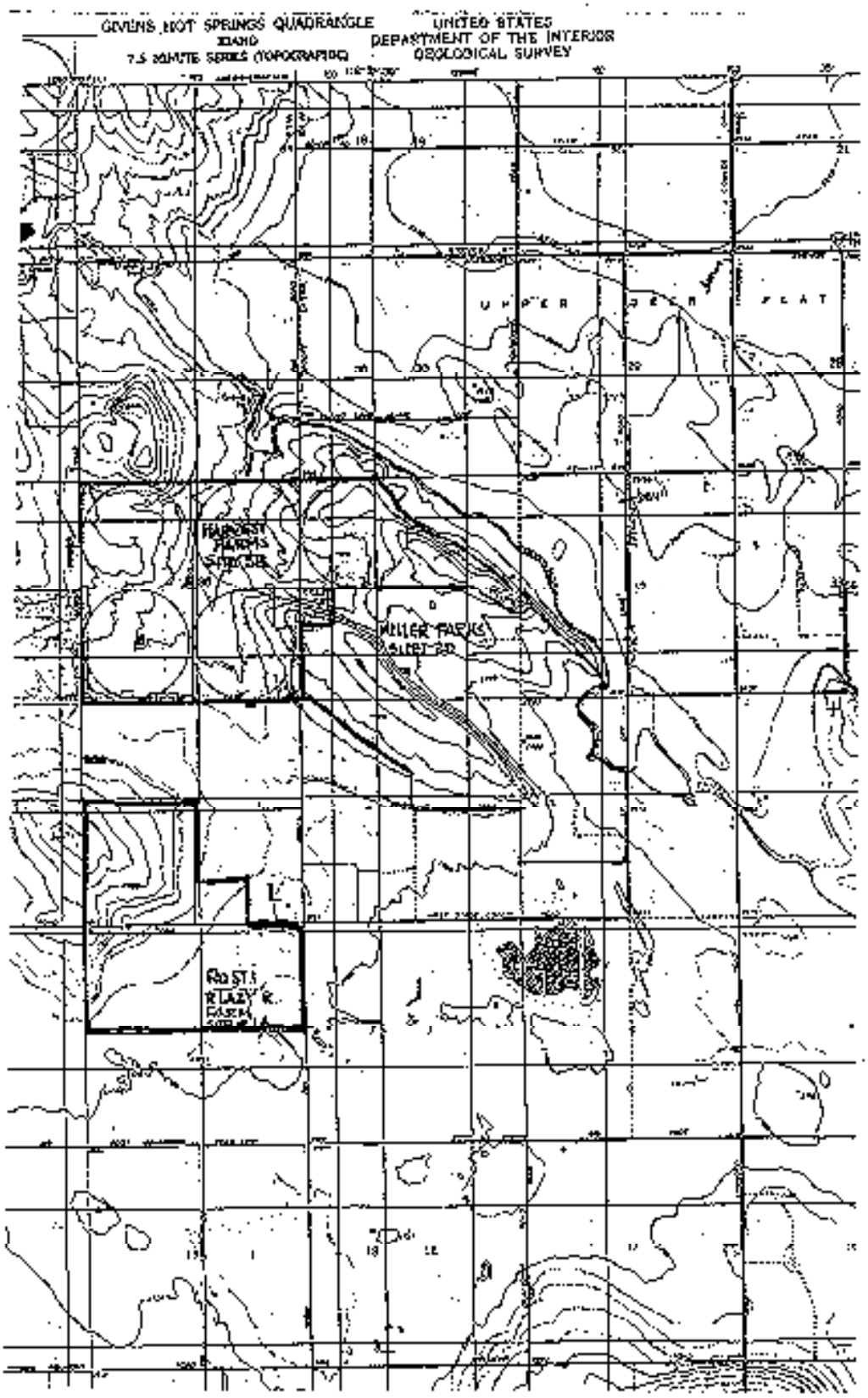
Specific Land Application Sites
(Boundaries are represented by dark, solid lines)



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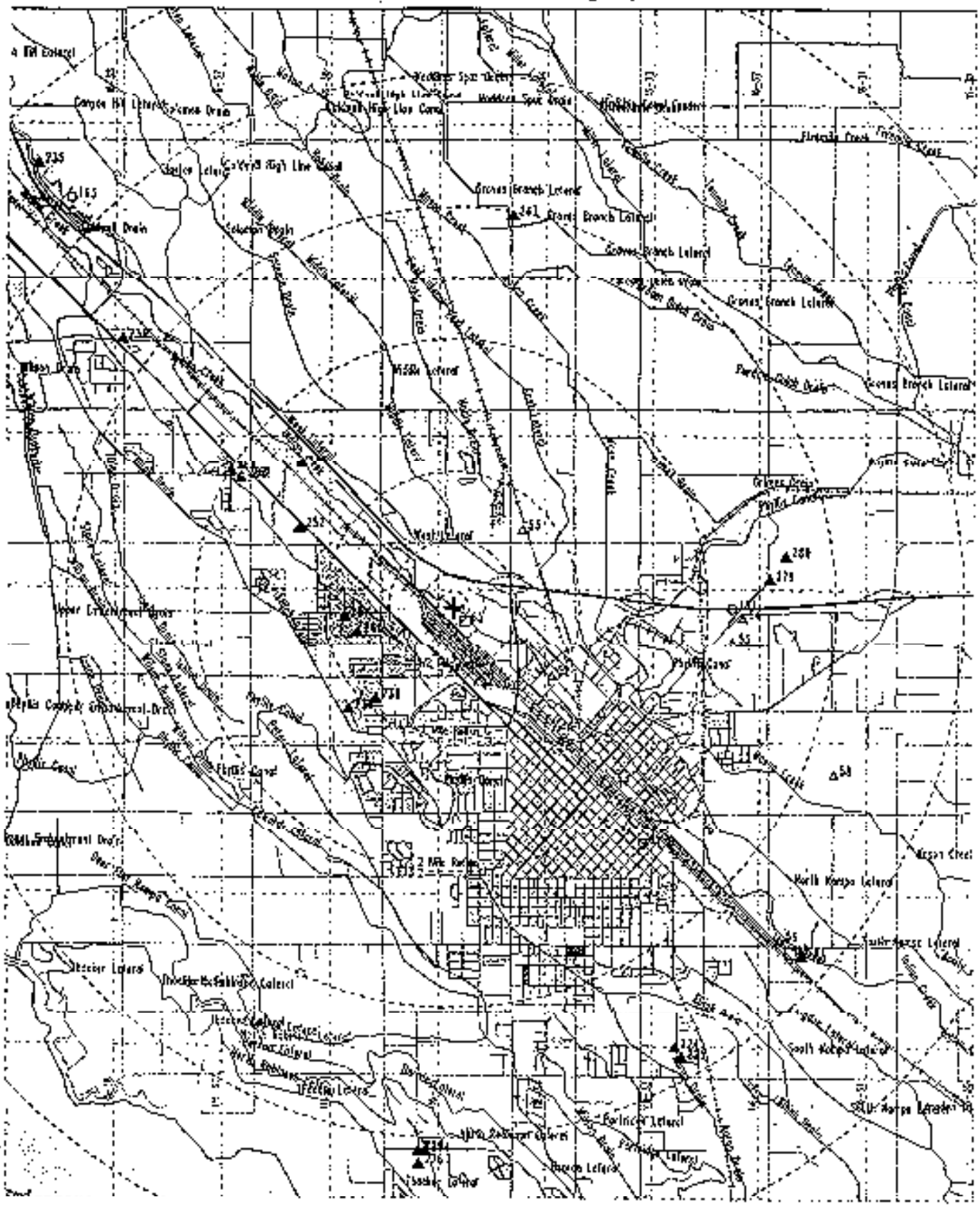
Specific Land Application Sites
(Boundaries are represented by dark, solid lines)

APPENDIX E

Location of NPDES Discharge Pipe



NPDES outfall is located in the center of map